

**Eighth Homework: MATH 410**  
**Due Tuesday, 27 October 2009**

1. Exercise 1 of Section 4.3 in the text.
2. Exercise 4 of Section 4.3 in the text.
3. Exercise 7 of Section 4.3 in the text.
4. Exercise 11 of Section 4.3 in the text.
5. Exercise 12 of Section 4.3 in the text.
6. Exercise 16 of Section 4.3 in the text.
7. Exercise 20 of Section 4.3 in the text.
8. Exercise 21 of Section 4.3 in the text.
9. Prove Proposition 1.2 on page 7 of the class notes.
10. Prove the assertion of Proposition 2.3 on page 10 of the class notes that  $L$  is the smallest possible Lipschitz constant.
11. Prove that  $f(x) = e^{-2x} \cos(3x)$  is Lipschitz continuous over  $[0, \infty)$  and find its smallest possible Lipschitz constant.
12. Suppose you are using the Newton-Raphson method to solve  $x^2 - 56 = 0$ . Use Proposition 2.7 on page 14 of the class notes to bound the error when your initial guess is 8.